REMARKS

This responds to the Office Action mailed on September 7, 2005.

Claims 1, 9, 13, 17, 22 and 30 are amended, no claims are canceled, and no claims are added; as a result, claims 1-39 are now pending in this application.

§103 Rejection of the Claims

Claims 1-24, 36-33, and 36-39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hochberg et al. (U.S. 4,981,724) in view of Ishitani (U.S. 5,330,936). Applicant respectfully traverses this rejection.

The cited Hochberg reference discloses CVD reactions using one of the following chemical combinations: $SiH_4 + O_2$; $4PH_3 + 5O_2$; $SiH_4 + 2N_2O$;. $SiH_2CL_2 + 2N_2O$ (see col. 11 line 14 to col. 12, line 22).

The cited Ishitani reference discloses a method of producing a selectively deposited silicon nitride film using CVD with ammonia and either silane or dichlorosilane with hydrogen chloride gas (see col. 2, lines 50-57). The outstanding Office Action uses the Ishtani reference to assert that it is known to deposit oxide on the inner surface of a trench, that it is known to add hydrogen chloride gas to ammonia or silane, and that it is known to allow a native oxide to form prior to depositing a dielectric layer.

The cited Hochberg reference does not disclose or suggest reactions where a silicon bearing gas component (either chlorine bearing such as dichlorosilane or non-chlorine bearing such as silane) and a ***separate*** chlorine bearing gas component are included in the reaction. While Hochberg does discuss one case where dichlorosilane is reacted with nitrous oxide, there is no separate chlorine bearing gas component since nitrous oxide does not contain chlorine, as required in Applicant's claims.

Applicant respectfully submits that the Office Action is incorrect in suggesting on page 8, first paragraph, that the Ishitani reference corrects the failure of the cited Hochberg reference to form a native oxide prior to depositing the dielectric layer. The indicated section of the Ishitani reference is believed by Applicant to relate to the selective growth of a nitride film on a polysilicon layer grown over a silicon oxide film, which is not suggested to be a native oxide, or

to be grown in a high temperature furnace operation prior to a nitride deposition, as recited in the present claims. The cited reference has a substrate having a silicon oxide layer with a patterned polysilicon layer. The cited section of the reference appears to refer to the single step of selectively depositing a "nitride film only on the silicon film region of the substrate", and has nothing to do with native oxide formation.

Applicant respectfully submits that the Office Action is incorrect in stating on page 8, second paragraph that the Ishitani reference would motivate one of ordinary skill to use distinct reaction gases "to eliminate the problem for example, particle-pollution, metal-pollution and damaging of the device with deterioration of characteristics of the device". The indicated section of Ishitani discussing the use of distinct reaction gases appears to be directed towards eliminating the "problems of particle-pollution, metal-pollution and damaging of the device with deterioration of characteristics of the device" by reducing the number of processing steps since it state that in "general, the degree of deterioration of the device quality may be in proportion to the largeness of the number of processes of fabrication" (see col. 2, lines 13-19) by use of the taught selective deposition of a nitride layer, which thus does not require a "patterning process comprises cleaning, coating a resist, baking, exposing, dry-etching and removing a resist and the like" (see col. 2, lines 12-14). Applicant respectfully submits that one of ordinary skill in the art would not be motivated to look to a selective nitride deposition method, such as disclosed by Ishitani, with a liquid source CVD oxide deposition method, such as disclosed by Hochberg, when attempting to solve a uniformity of deposition rate problem in an oxynitride deposition furnace, such as found in the present patent application.

Applicant respectfully submits that the Examiner has admitted on page 7, item 10 of the outstanding Office Action, that Hochberg fails to disclose at least the claimed feature of growing a native oxide. Applicant has expalined above that the cited Ishitani reference does not correct this failure of the Hochberg reference. The Examiner also admits on pages 6 and 7 that Hochberg does not disclose the use of distinct precursor and chlorine reactants, and Applicant has shown above that the cited Ishitani reference fails to provide motivation for one of ordinary skill to add a separate reaction gas for the chlorine component, since the cited reference is directed toward a selection deposition process and a different structure.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "...*wherein the reaction gasses include a silicon bearing component, the oxidizing component, and a chloride component, and wherein the silicon bearing component and the chloride component are included within distinct ones of the reaction gasses introduced into the chamber*...", as recited in independent claims 1 and 9, as amended herein. The cited references do not suggest the use of a distinct chloride source to improve the uniformity of chlorine distribution throughout the furnace tube in a non selective, blanket deposition of a dielectric layer.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "...*passing reaction gasses over the substrate, wherein the reaction gasses include a silicon bearing component, the oxidizing component, and hydrogen chloride, and wherein the silicon bearing component and the hydrogen chloride are included within distinct ones of the reaction gasses introduced into the chamber*...", as recited in independent claim 13, as amended herein. The reasons are similar to those given above with reference to the rejection of claims 1 and 9, which have similar language.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "...*wherein the reaction gasses include a silicon bearing component, the oxidizing component, an ammonia component, and a chloride component, and wherein the silicon bearing component and the chloride component are included within distinct ones of the reaction gasses introduced into the chamber* ...", as recited in independent claim 17, as amended herein. The reasons are similar to those given above, that the suggested combination does not teach the use of a separate gas component for uniform chlorine distribution in a non selective, blanket deposition of a dielectric layer.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "...*wherein the reaction gasses include a precursor component, the oxidizing component, an ammonia component, and a chloride component, and wherein the precursor component and the chloride component are included within distinct ones of the reaction gasses introduced into the chamber*...", as recited in independent claim 22, as amended herein. The reasons are similar to those given above.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "*...depositing a blanket dielectric layer over the substrate by passing reaction gasses over the substrate, wherein the reaction gasses include a silicon bearing component, an oxidizing component, and a chloride component, and wherein the silicon bearing component and the chloride component are included within distinct ones of the reaction gasses introduced into the chamber...*", as recited in independent claim 30, as amended herein. As discussed above, the suggested combination of references does not suggest a non selective deposition of a dielectric layer using separate chlorine and silicon gas sources.

Specifically, Applicant respectfully submits that the suggested combination of reference fails to describe or suggest at least the claimed features of "*...thermally oxidizing the silicon substrate, in the furnace tube, using gaseous reactants, which include a chloride component, dichlorosilane, and nitrous oxide, wherein the chloride component and the dichlorosilane are included in distinct gasses introduced into the furnace deposition tube...*", as recited in independent claim 36. In addition to the points raised above, the suggested combination of references does not suggest thermally oxidizing the silicon, in the furnace tube including a separate chlorine component, prior to depositing the dielectric layer.

In view of the discussion above indicating some specific differences between the claim features and the suggested combination of references, Applicant respectfully submits that the independent claims are in patentable condition. The dependent claims are held to be in patentable condition at least as depending from base claims shown to be patentable over the suggested combination. Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hochberg et al. in view of Ishitani as applied to claim 22 above, and further in view of Chung et al. (U.S. 6,838,125). Applicant respectfully traverses this rejection.

The cited Hochberg and Ishitani references have features discussed above. The cited Chung reference has been previously discussed and discloses a film deposited using a tantalum precursor component (col. 8, lines 1-7).

Applicant respectfully submits that the Chung reference does nothing to cure the above noted failures of the Hochberg and Ishitani references to suggest the use of separate gas components containing chloride and the precursor material, as recited in independent claim 22 and discussed above. Claim 25 directly depends upon claim 22 and is patentable at least as depending upon a patentable base claim..

In view of the above discussion with reference to claim 22, Applicant respectfully requests that this rejection of claim 25 be reconsidered and withdrawn.

Allowable Subject Matter

Claims 34-35 were allowed. Applicant thanks the Examiner for the indication of patentable subject matter.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney David Suhl at (508)-865-8211, or the below-signed attorney at (612) 373-6951 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date November 3, 2005 By _____
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 3 day of November, 2005.

KATE CANNON _____

Name

Signature